

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

BIOBASED XOREL[®] UNBACKED TEXTILE



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General Information

MANUFACTURER

Manufacturer	Carnegie Fabrics
Address	110 North Centre Avenue Rockville Centre, NY 11570
Contact	Charles Griffin, cgriffin@carnegiefabrics.com
Website	https://carnegiefabrics.com

PROGRAM INFORMATION

Program	The International EPD® System
Program Operator	EPD International AB, as provided by EPD North America
Address	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
E-mail	info@environdec.com
EPD Registration Number	S-P-12334
EPD Type	EPD of multiple products, based on the average of the product group
Publication Date	2024-02-01
Valid Until	2028-12-19

ACCOUNTABILITIES FOR PCR, LCA, AND INDEPENDENT, THIRD-PARTY VERIFICATION

Product Category Rules (PCR)	CEN standard EN 15804 serves as the Core Product Category Rules (PCR) Product Category Rules (PCR): Construction Products, 2019:14 v1.3.1 PCR review was conducted by: Claudia A. Peña, info@environdec.com
Life Cycle Assessment (LCA)	LCA accountability: Matt Van Duinen, WAP Sustainability
Third-party verification	Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: James Mellentine, Thrive ESG Approved by: The International EPD® System Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



General Information

PRODUCT

Product Name	Biobased Unbacked Xorel® Fabric
Product Coverage	Products included in the scope of this EPD: Biobased Xorel Cradle to Cradle Gold Certified products
UN CPC Code	Class 2671 Woven fabrics of man-made filament yarn
Geographical Scope	Manufacturing in Denmark and Belgium, shipped to the United States for warehousing, use, and end-of-life

ENVIRONMENTAL DATA SUMMARY

Declared Unit	1 m ² of unbacked fabric
Declared Unit Mass	0.32 kg/m ²
GWP-total, A1-A3 (kgCO₂e)	1.12E+00
GWP-fossil, A1-A3 (kgCO₂e)	1.05E+00
Secondary Material, Inputs (%)	100%
Secondary Material, Outputs (%)	91%
Total energy use (renewable and non-renewable), A1-A3 (MJ)	5.85E+01
Total Water Use, A1-A3 (m³e)	-3.24E-03

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programs, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

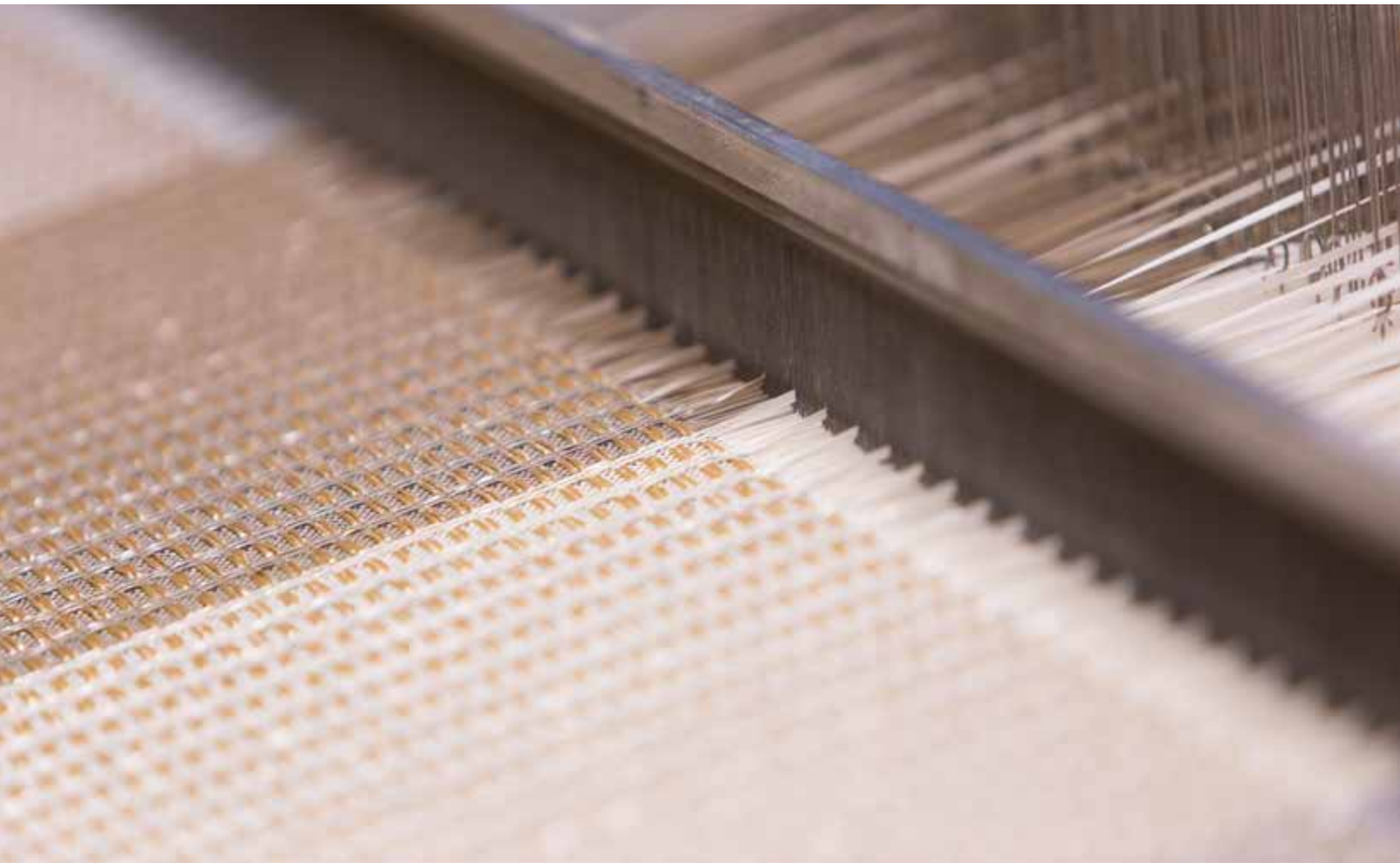
Product and Manufacturer

ABOUT CARNEGIE

Carnegie is a leading designer and manufacturer of sustainable commercial textiles and space management solutions. Founded on the principle that great design goes deeper than aesthetics, the company has championed responsible innovation for over 70 years, pushing the boundaries of what's possible and proving time and again that high-performance, beautiful and elegant solutions can be delivered sustainably. 100% PVC free from day one, Carnegie develops durable and healthy contract-grade alternatives to PVC, including its revolutionary Xorel[®] brand fabrics and a wide range of bio-based textiles.

As the nation's only B-Corp certified textile manufacturer, Carnegie leads the industry with an authentic commitment to sustainability. We strive to be the most trusted and innovative partner to our clients and to inspire a brighter, more sustainable future through advocacy and education. Our products have blazed a path of breakthroughs and firsts, and we carry on this tradition with a commitment to never settle, always do better, and constantly raise the bar, galvanizing the architecture and design community to build a better future with materials that matter.

We hold ourselves accountable by providing Health Product Declarations for every product we bring to market, and seeking third-party verifications for our product claims. Guided by a strong sense of social responsibility, we strive to continue improving our environmental transparency by bringing forth our Environmental Product Declaration (EPD) for Biobased Xorel[®].



Product and Manufacturer



ABOUT BIOBASED XOREL

Xorel has been meeting the challenge of the world's most demanding environments for over 40 years. Xorel is the world's first PVC-free alternative to vinyl products, debuting in 1981 after ten years in development, and kick-starting Carnegie's tradition of pioneering firsts. Born of a unique design approach that marries technology, craft, and experimentation, Xorel is an industry-defining commercial-grade performance textile that combines beauty, elegance, and legendary performance without negative environmental consequences.

Xorel is a polyethylene textile built on the inherent qualities of its yarn. The Xorel yarn is exceptionally strong, delivering remarkable durability and ease of maintenance without degrading for decades. It is stain resistant, colorfast, antibacterial and non-absorbent, free of chlorine, plasticizers, heavy metals, and toxic dyes, with zero added chemistry required to perform.

In 2013, Carnegie introduced a major breakthrough innovation - Biobased Xorel - the world's first plant-based commercial grade textile offering all of Xorel's legendary design and performance qualities, but made from plants. Biobased Xorel is derived from rapidly renewable sugarcane. With up to 91% plant content, it exceeds industry standards for "biobased" labels by up to 60%, and has a significantly reduced carbon footprint over fossil-fuel based products. For every ton of raw material produced, 2.5 tons of carbon are captured and sequestered, making Xorel Biobased a carbon-positive product. It can earn significant LEED points in four material categories.

Although it is sourced from sugarcane rather than fossil fuels, Xorel biobased does not compromise on performance. Just like the original textile, Biobased Xorel can stand up to high traffic environments and aggressive cleaning protocols. It can be hosed, scrubbed, and cleaned with bleach, so maintaining a healthy environment will never be an issue with Biobased Xorel.

Biobased Xorel breaks through the rampant greenwashing noise as the first and only textile to achieve Cradle to Cradle Gold and Living Product Challenge certification. Carnegie also offers a responsible return program for safe disposal. Backed by an unmatched 10 year warranty, Xorel's brand promise reflects the mission, values, and aspirations of the company that created it.

For more information, visit <https://carnegiefabrics.com/carnegie-xorel>

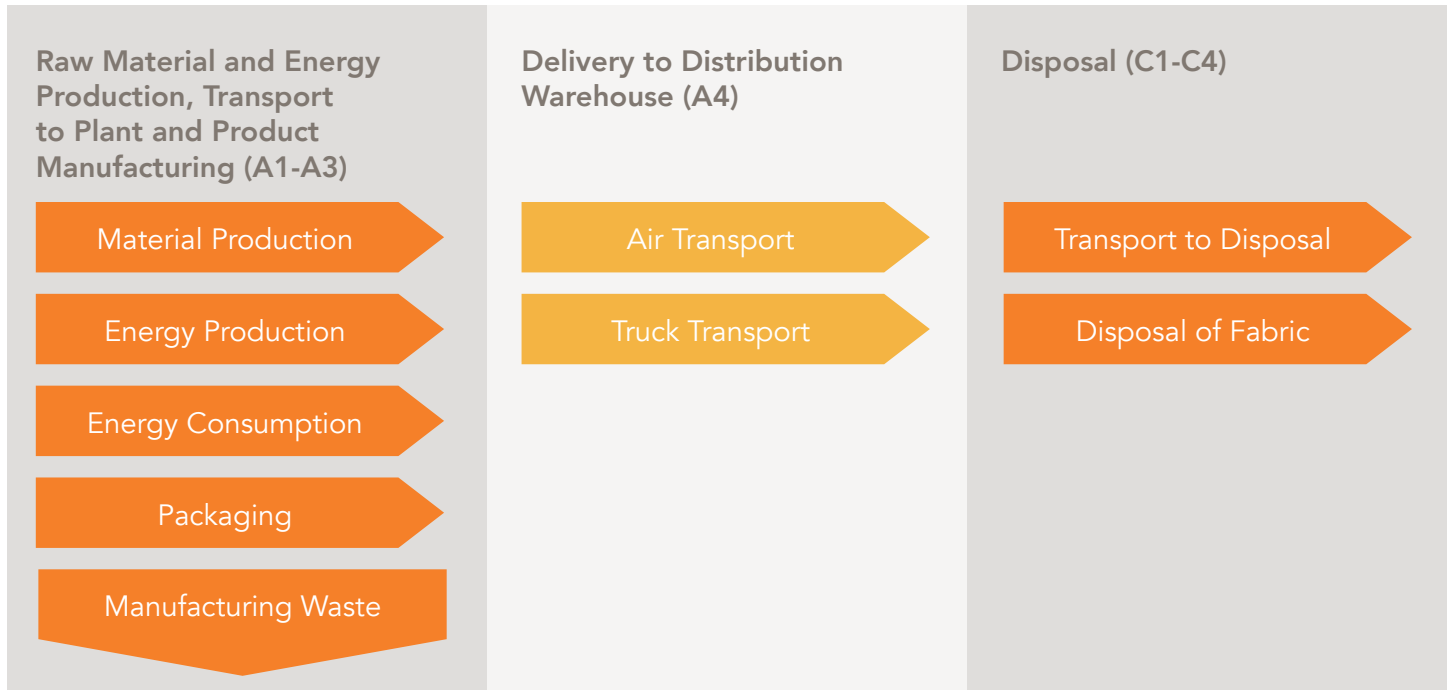


LCA Information

Declared Unit	1 m ² of unbacked fabric (0.32 kg/m ²)
Reference Service Life	Not declared as use phase is not included in the study
Description of the System Boundaries	Cradle to Gate with Options, including A1-A3, A4, C1-C4, and D Since Xorel fabric is an intermediate product and has a variety of potential in-use applications, the A5 (installation) and B1-B7 (use) modules are not included in this assessment.
Geographical Representativeness	A1-A2: global, A3: Belgium and Denmark, A4: Global, C1-C4, D: United States
Time Representativeness	Primary data collected for calendar year 2021
Cut-off Rules	All flows for which data were provided are included in the assessment, accounting for at least 99% of the energy or mass flows and at least 99% of the environmental impacts from the product system. Production of capital equipment is excluded from this assessment.
Database and LCA Software Used	LCA FE 10.7 (formerly GaBi) MLC Database 2023.1 (formerly GaBi Database)
LCA Report	LCA of Bio Xorel Fabric, WAP Sustainability, December 2023
Scenario Description: A2	Weighted average of transportation from suppliers: 250 km by truck Fuel Efficiency (full vehicle): 56.2 L/100km, Capacity Utilization: 61%
Scenario Description: A3	Electricity Source: country-specific residual mix with an average GHG-GWP of 0.341 kg CO ₂ e/kWh, along with on-site solar PV electricity production.
Scenario Description: A4 Transport to Building Site	Weighted Average of Products Sold Into European Market (500km by EU truck) and Products Sold into the US Market (50 km by EU truck, 6147 km by air, 1000 km by US truck). Fuel Efficiency (full vehicle): EU truck = 76.4 L diesel/100km, Air = 848 L jet fuel/100km, US truck = 42 L diesel/100km Capacity Utilization: EU truck = 61%, Air = 66%, US truck = 67% Volume capacity utilization factor: 1
Scenario Description: C1-C4 End-of-Life	0.32 kg collected with mixed construction waste and sent 100km by truck to end-of-life (15% recycled, 26% combusted with energy recovery, 59% landfilled per EPA) Fuel Efficiency (full vehicle): 56.2 L/100km, Capacity Utilization: 61%
Scenario Description: D Burdens/Benefits Beyond System Boundary	Recycling: impacts and losses from plastic recycling process, credit from polyethylene granulate Combustion with Energy Recovered: credit from produced steam and electricity

LCA Information

SYSTEM DIAGRAM



LCA Information

MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG RESULTS) AND DATA VARIATION (IN GWP-GHG RESULTS):

	Product Stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	Global		BE,DK	Global	ND	ND	ND	ND	ND	ND	ND	ND	US	US	US	US	US
Share of specific data	8%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	-34% to 23%*			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Product variation is due to the differences in product weights (kg/m2) caused by variations in design.

LCA Information

CONTENT INFORMATION

Product components	Weight*, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Polyethylene	0.30 (0.19-0.37)	0%	69% biogenic, 0.59 kg bio. C/kg
Polypropylene	0.016 (0.010-0.020)	0%	0%
Filler	0.0030 (0.0019-0.0037)	0%	0%
Pigments	0.0030 (0.0019-0.0037)	0%	0%
Stabilizer	0.0023 (0.0014-0.0028)	0%	0%
TOTAL	0.32 (0.20-0.40)	0%	0%
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Cardboard	0.0082	2.6%	0.44 kg bio. C/kg
Wood	0.011	3.5%	0.44 kg bio. C/kg
LDPE Film	0.0042	1.3%	0
TOTAL	0.024		

*Weights of the representative product are provided along with a range of all included products.

No substances in the product are on the Candidate List of Substances of Very High Concern (SVHC) which exceed the limits for registration with the European Chemicals Agency.

Results of the Environmental Performance Indicators

CORE ENVIRONMENTAL IMPACT INDICATORS

The results presented here are for 1 declared unit, which is 1 m² of Biobased Xorel® Unbacked Textile.

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5, B1-B7	C1	C2	C3	C4	D	Variation in Total Impacts ¹
GWP-GHG ²	kg CO ₂ eq.	1.76E+00	1.05E+00	ND	0.00E+00	2.59E-05	2.08E-01	4.08E-03	-1.49E-01	-35% to 23%
GWP-total	kg CO ₂ eq.	1.12E+00	1.05E+00	ND	0.00E+00	2.59E-05	4.73E-01	3.80E-01	-1.49E-01	-35% to 23%
GWP-fossil	kg CO ₂ eq.	1.05E+00	1.05E+00	ND	0.00E+00	2.58E-05	2.08E-01	4.06E-03	-1.49E-01	-34% to 22%
GWP-biogenic	kg CO ₂ eq.	-6.12E-01	1.25E-03	ND	0.00E+00	1.88E-08	2.65E-01	3.76E-01	0	-34% to 23%
GWP-luluc	kg CO ₂ eq.	6.80E-01	7.78E-05	ND	0.00E+00	2.91E-08	2.21E-06	1.49E-06	-9.83E-06	-37% to 25%
ODP	kg CFC 11 eq.	4.83E-10	5.81E-14	ND	0.00E+00	3.14E-18	7.36E-15	9.16E-15	-2.41E-13	0%
AP	mol H ⁺ eq.	8.29E-03	4.25E-03	ND	0.00E+00	7.70E-08	3.37E-05	2.42E-05	-2.21E-04	-36% to 24%
EP-freshwater	kg P eq.	3.34E-05	2.91E-07	ND	0.00E+00	1.26E-10	3.10E-09	4.88E-06	1.91E-08	-36% to 24%
EP-marine	kg P eq.	1.32E-02	1.93E-03	ND	0.00E+00	3.79E-08	7.19E-06	6.07E-06	-7.55E-05	-37% to 25%
EP-terrestrial	mol N eq.	2.67E-02	2.12E-02	ND	0.00E+00	4.18E-07	1.54E-04	6.64E-05	-8.28E-04	-36% to 24%
POCP	kg NMVOC eq.	7.67E-03	5.44E-03	ND	0.00E+00	7.50E-08	1.98E-05	1.84E-05	-2.25E-04	-36% to 24%
ADP-minerals & metals ³	kg Sb eq.	2.01E-07	1.19E-08	ND	0.00E+00	1.68E-12	3.11E-10	2.27E-10	-1.59E-08	3% to -2%
ADP-fossil ²	MJ	1.86E+01	1.42E+01	ND	0.00E+00	3.36E-04	1.01E-01	6.16E-02	-4.09E+00	-33% to 22%
WDP2	m ³	-9.67E-02	2.81E-03	ND	0.00E+00	1.49E-06	1.63E-02	2.10E-04	-2.79E-02	-1% to 0%

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of modules A1-A3 shouldn't be used without considering the results of module C. A1-A3 results include the "balancing-out reporting" of biogenic CO₂ of packaging, traditionally released in A5. Additional optional indicators per EN 15804+A2 are not declared, including: particulate matter emissions; ionizing radiation, human health; eco-toxicity (freshwater); human toxicity, cancer effects; human toxicity, non-cancer effects; land use related impacts/soil quality.

¹ The variation in total impacts is due to variations in product weight from a minimum of 0.2 kg/m² to a maximum of 0.4 kg/m² and is calculated as the percent difference from the total impacts (modules A-C) of the representative product with a product weight of 0.32 kg/m². Values in this column should be read in the following way: -15% to 10% means the minimum weight product has 15% less total impact than the representative product while the maximum weight product has 10% more total impact than the representative product.

² This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

³ Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Results of the Environmental Performance Indicators

RESOURCE USE INDICATORS

The results presented here are for 1 declared unit, which is 1 m² of Biobased Xorel® Unbacked Textile.

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5, B1-B7	C1	C2	C3	C4	D	Variation in Total Impacts ¹
PERE	MJ	2.94E+01	6.13E-02	ND	0.00E+00	1.44E-05	1.78E+00	7.35E-03	-2.25E-01	-27% to 18%
PERM	MJ	1.04E+01	0.00E+00	ND	0.00E+00	0.00E+00	-1.77E+00	0.00E+00	0.00E+00	-37% to 25%
PERT	MJ	3.99E+01	6.13E-02	ND	0.00E+00	1.44E-05	5.82E-03	7.35E-03	-2.25E-01	-29% to 20%
PENRE	MJ	1.32E+01	1.43E+01	ND	0.00E+00	3.61E-04	1.04E+00	6.28E-02	-4.16E+00	-32% to 21%
PENRM	MJ	5.45E+00	0.00E+00	ND	0.00E+00	0.00E+00	-9.36E-01	0.00E+00	0.00E+00	-37% to 25%
PENRT	MJ	1.86E+01	1.43E+01	ND	0.00E+00	3.61E-04	1.01E-01	6.28E-02	-4.16E+00	-33% to 22%
SM	kg	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%
RSF	MJ	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%
NRSF	MJ	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0%
FW	m ³	-3.24E-03	1.11E-04	ND	0.00E+00	4.93E-08	3.81E-04	7.78E-06	-8.13E-04	-47% to 32%

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of modules A1-A3 shouldn't be used without considering the results of module C. A1-A3 results include the "balancing-out reporting" of biogenic CO₂ of packaging, traditionally released in A5. Additional optional indicators per EN 15804+A2 are not declared, including: particulate matter emissions; ionizing radiation, human health; eco-toxicity (freshwater); human toxicity, cancer effects; human toxicity, non-cancer effects; land use related impacts/soil quality.

Results of the Environmental Performance Indicators

WASTE AND OUTPUT FLOW INDICATORS

The results presented here are for 1 declared unit, which is 1 m² of Biobased Xorel® Unbacked Textile.

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5, B1-B7	C1	C2	C3	C4	D	Variation in Total Impacts ¹
Hazardous waste disposed	kg	1.06E-06	2.80E-11	ND	0.00E+00	1.04E-15	3.59E-12	1.57E-12	-1.49E-01	-35% to 23%
Non-hazardous waste disposed	kg	1.35E-01	1.28E-03	ND	0.00E+00	3.14E-08	1.83E-02	1.87E-01	-1.49E-01	-35% to 23%
Radioactive waste disposed	kg	1.10E-03	1.32E-05	ND	0.00E+00	1.03E-09	1.77E-06	6.95E-07	-1.49E-01	-34% to 22%
Components for re-use	kg	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	-34% to 23%
Material for recycling	kg	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	4.80E-02	0.00E+00	-9.83E-06	-37% to 25%
Materials for energy recovery	kg	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	8.45E-02	0.00E+00	-2.41E-13	0%
Exported energy, electricity	MJ	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	4.60E-01	-2.21E-04	-36% to 24%
Exported energy, thermal	MJ	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	1.85E-01	1.91E-08	-36% to 24%

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of modules A1-A3 shouldn't be used without considering the results of module C. A1-A3 results include the "balancing-out reporting" of biogenic CO₂ of packaging, traditionally released in A5. Additional optional indicators per EN 15804+A2 are not declared, including: particulate matter emissions; ionizing radiation, human health; eco-toxicity (freshwater); human toxicity, cancer effects; human toxicity, non-cancer effects; land use related impacts/soil quality.

Results of the Environmental Performance Indicators

ACRONYMS

GWP-fossil	Global Warming Potential fossil fuels
GWP-biogenic	Global Warming Potential biogenic
GWP-luluc	Global Warming Potential land use and land use change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential, Accumulated Exceedance
EP-freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine	Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestrial	Eutrophication potential, Accumulated Exceedance
POCP	Formation potential of tropospheric ozone
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources
ADP-fossil	Abiotic depletion for fossil resources potential
WDP	Water (user) deprivation potential, deprivation-weighted water consumption
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials
PERT	Total use of renewable primary energy resources
PENRE	Use of nonrenewable primary energy excluding non-renewable primary energy resources used as raw materials
PENRM	Use of non-renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy re-sources
SM	Use of secondary material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water

References

- General Program Instructions of the International EPD® System. Version 4.0.
- PCR 2019:14. Construction Products. Version 1.3.1.
- EN 15804:2012+A2:2019/AC:2021. European Committee for Standardization.
- Life Cycle Assessment for Biobased Xorel Unbacked Textile, Carnegie. WAP Sustainability. July 2023



Materials That Matter™



Carnegie is B Corp certified since 2014, ensuring ethical and responsible business practices.



Carnegie is a member of the Be Original organization, which protects original design.



The first and only 100% PVC-free company in the industry.



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